PROJECT #1 (MILESTONE 2)

CSC 261/461 (Database Systems), Fall 2018,
University of Rochester
Due Date: Tuesday, 10/16/2018 (11:59 pm)

Introduction

Our next milestone is all about designing the database. In milestone 1, you did the requirement analysis and come up with the relevant entities. You had provided a rough sketch of various components of your database. For this milestone, you will cover both, the conceptual and logical design of your database. All you need to do for this milestone is to provide an ER model and then convert it into relations (tables). You are allowed to modify the relations you had come up with for milestone 1 if required. Please note that your submission will not be accepted if you have less than 4 relations effectively.

Task A: Draw an ER diagram

This ER diagram should reflect the proposal you have submitted. You should start afresh, and this time begin with designing the ER diagram. Start with the basic entity sets you described in your proposal and then add/remove/modify entities, attributes, and/or relations to your model.

For this project, you are only allowed to use Chen Notation. Model the entities, attributes, and relationships. Find if a few of these entities/relationships are weak. Is there any class hierarchy in your ER diagram? If yes, model those as 'is-a' relations.

Provide the cardinality, total participation, and (min, max) constraint for each entity (for each relation). State your assumptions.

There are many utilities on the web for drawing these ER diagrams. For example: `https://creately.com/` and `www.draw.io`.

(Save the ER diagram in case, you later decide to modify the diagram later)

Task B: Relational Database Design Using ER-to-Relational Mapping

Once the ER diagram is ready, you need to convert the ER model into relations. Your report should have the following components:

1. ER-to-Relational Mapping Algorithm

    - Go through Chapter 9 of Elmasri's book and follow the steps (Step 1-9) to convert your ER diagram into a Relational Mapping. State how your mapping handles each of these steps. If any step is not applicable, mention that. After describing all the steps, draw a figure similar to Figure 9.2 on the textbook.

    - Finally, provide a table which summarizes the mapping. For, example, the following table shows the correspondence between ER diagram on Figure 9.1 and Relational Schema on Figure 9.2. (E, R, and A represent Entity Set, Relationship, and Attribute respectively)

Relation Name	ER diagram components
Employee	E(Employee)) + R(Works_For) + R(Supervision)
Department	E (Department) + R (Manages))
Dept_Locations	A(Locations)
Project	E(Projects) + R(Controls)
Works_On	R(Works_On)
Dependent	E(Dependent) + R(Dependent_Of)

2. Schema of your database

- Provide a list of all the relations (tables). Indicate the primary key and foreign keys (if any) for each relation. Justify your choice. Are there any unique keys?
- Write the detailed description of each attribute (for each table), its purpose and datatype.
- Indicate each attribute's default value (if any) or if the attribute can be set to 'null'.
- Explain the actions taken on any foreign key when the the correpondiny tuple for the referred table (i.e., the table the foreign key refers to) is deleted. The possible actions are: no action, delete cascade, set null, set default.

How to submit

Save your report as **Milestone2.pdf** and upload it to Blackboard. You should now be able to submit as a group.

Also, include, the name and ClassID of each team members, his/her contribution, and total % of work s/he had accomplished for this milestone.